GARDEN AND FOREST.

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The Timber-supply of the United States.

SOME years ago, Mr. Henry Gannett, Geographer of the United States Geological Survey, prepared a paper in which he attempted to prove that the beneficial influence of forests was not nearly as important as was generally supposed, and that in some cases this influence was detrimental. In the course of his discussion he urged that "in our arid region, which is dependent for irrigation upon its streams, it is advisable to cut away as rapidly as possible all the forests, especially upon the mountains, in order that as much of the precipitation as possible may be collected in the streams. This will cause an increase in the annual flow of the streams, coupled with greater concentration of the flow in the spring months." A fact worth noting is that Major Powell, the distinguished Director of the same Survey, also advocates the destruction of the western mountain-forests, but for the contrary reason. He denies that this destruction would concentrate the flow of the water in spring floods, as Mr. Gannett asserts, but argues that it would deliver the water more equably to the streams below. According to Major Powell's theory, when the trees are gone the snow will be swept into gulleys, so that the available water-supply of the valley below will be deposited in snow-banks and trickle slowly into the general circulation as it melts throughout the summer. The notion that for either of these conflicting reasons, or for any other reason, it is a patriotic duty to help on the extermination of our western mountain forests has not made much headway, however, and no acts of the late administration have received a more enthusiastic approval by the people and by men of science than the establishment of forest-reservations, and, no doubt, the people are right. It is true that some popular arguments for protecting the forest-cover of the hills have been based on fancy or sentiment rather than on fact, but the tendency of the most careful scientific investigation of recent times is to corroborate what has been accepted as the teaching of experience, namely, that disaster to the plain is sure to follow the destruction of the forest-cover of the mountains.

Mr. Gannett has just caused the wide publication of another article to show the folly of extending any protective policy toward the forest. The first part of the article, which attempts to undermine the prevalent belief in reference to the influence of forests on climate and soil, needs no consideration here, since no new facts are brought forward, and even the unproved statements have all been discussed before. The second portion of the paper is devoted to the question, "Is our timber-supply sufficient to withstand the great and increasing demands upon it?" Mr. Gannett contends that it is; that, in fact, the timber is growing faster than it is cut away, or, in other words, that we are not spending all our income, but adding to our capital. It follows, of course, that there is no need to stay the axe, but, on the contrary, since the supply of coal and of iron ore can never increase, it is true economy to use more wood for fuel to save the coal, and to use timber wherever it can supply the place of metal to save our rapidly diminishing supply of iron.

Mr. Gannett demonstrates the soundness of his proposition by a simple arithmetical calculation. There are in the United States 750,000,000 acres of woodland. On each acre forty cubic feet of wood are produced every year. Therefore, the entire woodland of the country produces annually 30,000,000,000 cubic feet of wood. Now, the annual cut is between 20,000,000,000 and 24,000,000,000 cubic feet, and this deduction leaves from six to ten billions of cubic feet of wood to be added to our capital every year. Now, this proof would be conclusive if the original data were correct, but the fact is that these are little more than guesses, and some of them wild guesses at that. The given extent of the wooded area of the country is based on several estimates of varying value, and no one knows how nearly correct any of them may be. It is well known, however, that much of this territory, which is counted as woodland, is not, in the remotest sense, a productive forest. And how does Mr. Gannett know that each of these acres would yield forty cubic feet of wood? The amount of timber produced in a given time by any tree depends on the sort of tree, the soil in which it grows, its age, and a hundred other conditions, and the yield of an average acre over the so-called forest-area can only be found with reasonable certainty after close investigation of the whole region. In the farmr-eturns of the census, land was returned as forest which had grown up with sprouts and Blackberry-bushes, and might produce a hundred feet to the acre, or ten. In much forest-land recently cleared, and afterward swept over by fire which has burned away the soil down to the very rock, there is now a growth of Briers and stunted Pigeon-cherries, but it has no significance whatever in the timber-supply of the country, although if let alone it would help to prepare the ground for a forest some hundred years hence. The same is true of the growth of scrubby trees which are extending over ground which has once been cultivated in some New England states, and there are miles of virgin forest still standing which reached its maximum development long ago and contain no more wood to-day than they did when the Pilgrims landed. The chief of the Forestry Division of the Department of Agriculture names twenty-five cubic feet as the possible yield for an average acre of the so-called woodlands in the United States, and in one of his annual reports it is estimated that, instead of adding to our capital several billions of feet of wood a year, we are actually consuming twice as much as our woodlands yield. Mr. Fernow, however, only gave this as an approximate estimate, but it is without doubt as trustworthy as Mr. Gannett's assertions or the figures with which he fortifies them.

To enforce his thesis, that the "laissez faire policy is the best that can be devised for the protection of our forests," Mr. Gannett goes on to "venture the assertion that there is to-day nearly, if not quite, as great an area of woodland in the United States as when the white man set foot on our shores." When the New World was discovered, so far as we can judge from the narratives of early travelers, and from what we know of the climate and topography of the

land, a continuous forest extended from the shores of the Atlantic to beyond the Mississippi, except where the prairies were projected, like a great bay, to the shores of Lake Michigan and a few treeless valleys, where the Indians seem to have set annual fires to facilitate the chase of the buffalo, which, in those days, ranged far eastward. There were other treeless regions, as, for example, a fringe of salt-marsh along the seaboard, some narrow river-bottoms subject to annual floods, and here and there a clearing where the Indians cultivated corn. Treeless, too, in those days were the summits of the White Mountains, and probably some of the summits of the Alleghanies, as they are to-day. Out of this forest have been cut, according to Mr. Gannett's estimate, 270,000 square miles which are now devoted to agriculture, besides the land occupied by cities, highways, etc. Undoubtedly, forests have in recent years encroached largely upon the prairies, and woods have started in some of the once treeless valleys of Pennsylvania and Virginia. But what trustworthy data are at hand to prove that this forest-increase covers anything like the quarter of a million and more of square miles which was once forest, and now is plow-land? Until some careful survey shall show the contrary, the people at large will not be persuaded that after working steadily for centuries to get rid of our forests we have not been able to prevent them from holding their own against axe and fire.

In the above estimate no guess is made at the amount of timber wasted in lumbering operations, by fire, or by other causes, although Mr. Gannett admits that this useless destruction is extensive. It is well known, however, that in many cases only a comparatively small portion of the material in the standing trees is marketed, while the remainder is left to rot on the ground, and in the Tenth Census it is estimated that in a single year fire had run over ten million acres of forest-land. All these facts are so well known that there would be little need of noticing the statement of Mr. Gannett that the area of the country's woodland is increasing but for the fact that he is one of the most distinguished geographers in the country, and there is danger that his random conjectures on matters with which he is not familiar will be accepted as of equal weight with his carefully considered utterances on subjects within his own special branch of science. Certainly Americans have never shown such an undue veneration for their forests that there is need to belittle their influence or value. The growing scarcity of some of our most valuable woods is one proof that we have failed to appreciate them as we should. Instead of advising the people to let our forests take care of themselves we should welcome every effort to instruct them as to the importance of forests in their relation to the life of civilized man. It is a wasteful policy to allow them to struggle on without assistance, even in a region where trees will spring up of themselves whenever they have an opportunity, for skilled forest-management means an increased production of improved material. To permit their extermination on the arid slopes, where they will not reproduce themselves without human assistance, would be a crime for which posterity would justly execrate us.

Notes from Central California.

LARKSPUR is in Marin County, California, about thirteen miles from San Francisco, and at the foot of Mount Tamalpais. The valleys and slopes of the lower ranges of hills were originally covered with a magnificent growth of Redwood, Bay, Madroña, Live Oak, White Oak, Tan-bark Oak and Buckeyes. There was a saw-mill erected here in 1847, one of the first on the Pacific coast, and all of the trees easy of access were felled. A few years later wood-choppers were all through the hills cutting the remainder of the timber and selling it to the brick-yards at four dollars per cord. After the choppers had completed their work fires ran over the hills, and have done so every few years since. But, despite all of this, a few fine specimens of all the above-mentioned trees are found in the sequestered nooks overlooked by the woodmen, but most of the hill-sides are covered with a thick growth of chapparal, consisting of Manzanita, Heteromeles, Ceanothus, Poison Oak, Adenostoma, Baccharis and other low-growing shrubs. In the valleys and moist spots on the hill-sides the Redwoods are growing in circles about the stumps of the fallen trees. They are from thirty to seventy-five feet high and as straight as an arrow. The original trees were of an enormous size in the main cañon, some of them measuring over twenty-five feet in diameter, and the wood, which seems almost indestructible, is now as sound as it was the day it was cut, forty-seven years ago. There are places along the creek where the banks have washed away, showing large logs six feet below the surface, where they have lain, perhaps, for hundreds of years.

Stumps of the California Bay-tree (Umbellularia Californica) are frequently found from three to five feet in diameter, and still alive at the roots, sending up shoots annually, and annually eaten off by the stock raised on the hills which are too steep to cultivate. Some fine old specimens are still standing, and some of the young ones which have got the start of the cattle are now fine large trees. This tree, to my eyes, is the most beautiful of the California broad-leaved evergreens. A few Oregon Maples (Acer macrophyllum) are found here, but a great deal of dead wood appears among their branches to show that the locality does not agree with them. The Elder here makes a large forest-tree, in some instances being over two feet in diameter. A few Azaleas, here called Honeysuckles, are found growing along the water-courses, and on the hill-sides are found impenetrable masses of Ceanothus, just now in bloom. Here we also find the evergreen Huckleberry (Vaccinium ovatum), especially where the fires ran over the hills two years ago. Ceanothus-seedlings are also seen here, but none are found under the older bushes, where millions of seeds fall every year. A few fine specimens of the Tan-bark Oak (Quercus densiflora) are still standing. This tree is also very tenacious of life, and springs up rapidly from the collar. On the northern face of the low range of hills dividing Larkspur Cañon from Ross Valley the trees are much more difficult to reach, and considerable of the natural timber is still standing, among them fine large trees of Quercus agrifolia, Q. densiflora, Q. Kelloggii, Madroña (Arbutus Menziesii), Bay, Redwood and the beautiful and rare Torreya Californica, or California Nutmeg, one specimen being over seventy feet high and three feet in diameter. The trunk continues this size to the first branches, some twenty feet from the ground. The first flowers to appear here this season were those of Scoliopus, followed by Castilleia, Dodecatheon, Cynoglossum, Eschscholtzia, Ranunculus, Tellima, Vaccinium, and then the ever-beautiful Manzanita was covered with bloom.

Larkspur, Calif. *Thomas H. Douglas.*

Notes of Mexican Travel.—II.

ON THE TAMPICO BRANCH.

LET us consider in detail the several diverse districts traversed by the Tampico branch of the Mexican Central. Heading for the north-east from San Luis, the train now glides over plains whose arable portions are sown to Wheat in winter and planted to Corn in summer, wherever irrigation is possible, or in summers when the rainfall is sufficient to make a crop of Corn without irrigation; or, anon, it winds among dry, rocky hills scantily covered with vegetation, conspicuous amongst which are various wild Cactuses and Agaves. Fifty miles out from San Luis we enter the San José Pass of the Guadalcazar Mountains, mountains of gray limestone, moderately forested and the haunt of deer. The principal arborescent species here are Quercus grisea and polymorpha, Juglans Mexicana and Sargentia Greggii. In meagre soil, partially covering extensive ledges of lime-rock, was found here Neopringlea integrifolia, Watson, a slender shrub, ten to fifteen feet high. Rooting in the fissures of the bare ledges was found an undescribed Dahlia, D. dissecta, Watson, with finely dissected leaves and purple flowers. On these ledges certain Rock-brakes grow in abundance and in perfection; Pellæa pulchella, Notholœna sinuata and Aschenborniana, Cheilanthes leucopoda, etc.

By a sinuous grade cut in the mountain-side the road descends to a lower bench of the table-lands, the plains of Cerritos, similar in character to those left behind; and thence our course bears eastward.

Beyond the town of Cerritos the road leads for forty miles over the great hacienda of Angostura, an estate owned by the family of Espinosa y Cervantes, descended from the old Spanish Counts of Peñasco. This family does not dislike Americans on general principles, and is, of course, given to the practice of the fullest Mexican courtesy and hospitality. So, in its great

country house, a few miles south of the station of San Bartolo, my friends and I have been entertained from time to time, as had been Drs. Parry and Palmer a dozen years before, and were given guides and transportation over the estate, whether our object was the pursuit of game, deer, turkeys, etc., or a search for plants. Of wonderful interest to me was the hacienda of Angostura. A large stream of water has been brought through the barrier of hills above the hacienda-house by means of cuts and tunnels, showing excellent engineering. Carried in open ditches over the fat, black soil of the adjacent plain, this water ensures for Angostura unfailing crops of Wheat and Corn. Where the waste water of this stream flows down the valley, it gives rise to a swamp, many miles in extent, of the Mexican Cypress, Taxodium mucronatum. The trees are immense; a trunk diameter of ten feet is not rare; and the great trunks are often undivided for a long distance from the base. Going from the house to the station of San Bartolo, our road, after passing the tillage, enters a Mesquite forest with lagoons. The trees are at first of the largest size for the species, two feet in diameter, and are hoary with Tillandsias; but they become sparse and stunted as we near the station, and the soil becomes white with alkali and is bare, except as it is dotted with clumps of Atriplex, Suæda, etc. On this white plain, a short way east of the station, when, for the first time, we alight there in the dim light of the early morning, our attention is arrested by columns of steam arising from pools and streams rimmed with green sod. We stop to explore the vicinity, and it requires several days to secure all the plants, new or rare, which it yields us. In little open meadows, lying here and there amid scattered groves of Mesquite and Juniper, we come upon these streams of warm water, which are remarkably transparent and show a bluish tinge. These issue from subterranean channels, meander a little way on the surface, forming sometimes broad, deep pools, and then abruptly disappear from view again. Near by these living streams are long, tortuous, shallow lagoons, fast drying up. Such water as remains in lowest hollows is thick and brown with alkali; and the dried margins are deeply covered with salts of a dirty-white color. A deathly odor pervades their neighborhood; dead, gaunt trees stand around, and in the tops of these great ghostly white birds perch, watching over the silent scene and adding to the uncanny feeling we experience here.

Going on from San Bartolo to the station of Las Tablas, passing on our way another Mesquite-forest, passing a considerable forest of Juniper (Juniperus occidentalis, var. conjugans), and a low flat which is covered with fine deep alkali dust, like a layer of ashes, a soil which is said to be slimy and nasty in the extreme when wet, and which bears, amid crimson-fruited Opuntias, little but a few stunted and half-dead Mesquite-trees, we find ourselves at Las Tablas upon ampler meadows than those of San Bartolo, meadows miles in extent, covered with deep grass, interrupted by belts of Juniper-forest and bounded by gray desert hills of half-bare lime-rock. These meadows appear to rest on a subterranean lake. A tough sod and layer of black soil a few feet in thickness covers mud and water. In the railroad-ditches animals are liable to break through the crust and to be lost. If you dig a hole a few feet deep you may strike upon a water-course and see little fishes passing. Anywhere at intervals over this strange meadow we may come upon a circular pool some fifty feet in diameter, where an underground stream comes up to the surface, and from which a stream flows away for a short distance, taking any direction as would appear, and then plunges into the soil. These fountain-pools are so deep that their bottom cannot be discovered, as we peer down through their limpid water. Curious little fishes abound in them; black they are, with white backs. Around their shallower margins commonly grows a white-flowered Pond-lily (Nymphæa ampla). Upon the verge of pools and brooks Sedges crowd, chiefly Rynchospora mariscus and Carex Pringlei, Bailey, n. sp., and stand six to eight feet high.

We tramp these meadows for miles and miles through deep Grass, Spartina densiflora, the sharp points of its rigid leaves annoying us greatly. Before us scuttle away half-wild herds of cattle, sleek and fat, herds of horses and mules, whose smooth coats show scarce a saddle-mark, and droves of plump donkeys, whose backs have never known a galling load. In order to obtain a view of the country we mount a rocky hill on the border of the meadow, and there among Tree Cactuses come upon a spot where a tiger-cat has recently killed a deer, and with the aid of vultures has already disposed of its carcass. There are found alkali sinks in which few or no plants can grow. In places the soil is quaky; open pits or dark pools yawn before us; some of the streams are hard to cross in safety; we find the body of a horse which has wallowed to his death in the mire; and from all these comes a slight sense of peril which lends excitement to our exploration of the region.

When we leave Las Tablas and the limits of the hacienda of Angostura the train hurries us for twenty miles over a dusty plain between parallel ranges of dry hills. Here, in sharpest contrast with the green country just left, is presented a scene of the utmost desolation. A thin growth of desert shrubs and stunted trees, with Cactuses, covers the plain. Here are Mesquites but fifteen feet high which are venerable with age, hoary and shaggy with lichens and Spanish moss. Everything is draped in this gray, and everything seems to be starved and sickly. This plain and the enclosing hills are a station for Yucca australis (Engelmann), Trelease, and the hill-sides bear that curious thing, Hesperaloe Engelmanni. But beyond Cardenas, the next station, and its billowy, grassy hills, on which Corn-fields appear in autumn, what a change of scene again! We will let the train go on its way to wind in bewildering curves among these hills and the curious knobs of lime-stone below them, where the strata is set on edge, and will ourselves walk down the trail to Las Canoas, a station a dozen miles distant and nearly a thousand feet below. This we do that we may pass through La Labor, a village of the quaintest and most picturesque houses, which are thatched with Palm or Yucca leaves. A little way below the village we descend into a narrow valley between Oak-covered hills. The soil of this valley is deep and black with humus; so we find here fields of Corn as dense and as tall as the Corn of a Mississippi bottom.

The Valley of Las Canoas, however, is the most charming spot on all our line. Lying among wooded hills at the head of the great Tamasopo Cañon, through which rain-clouds are always, you might think, pouring up to water its grassy slopes and tilled flats, it shows perpetual verdure and unfailing crops. The soil is a red clay loam, and it would seem that the Grape and most other fruits ought to flourish here in perfection. Here, from a hill-side cave, issues a stream of the purest water, and behind the village is a wild and deep barranca containing another stream. These waters united have cut through the mountains next ahead of us the wonderful Tamasopo, which has afforded a pass for the railroad. To bring the railroad up through the mountains from the hacienda of Tamasopo on the bench next below to this plain of Las Canoas (for the construction of the road advanced from the east to this point) was a great triumph of engineering. Let us go on by train from Las Canoas. Gliding beside the stream, whose course giant Cypresses mark, the train advances cautiously to the gate of the cañon. It enters above plunging, boiling waters. Then for eight or nine miles the road-bed has been cut in the rock of the steep mountain-side, or has been laid on walls which spring from far below. On such dizzy heights the train hangs and sways and winds through constantly occurring curves. Where mountain-buttresses interposed, tunnels open a way, till eight are passed. Within the cañon long vistas of the wildest mountain-scenery open before us. We awake resounding mountain echoes. Below us yawns the fearful gulf. The opposite mountain-side is precipitous in places, in others cut by gorges. It is everywhere covered with a variety of trees, except here and there on the steeps near the summit, where some Indian has built his hut and cleared a plat for Corn or Bananas. Outside the narrow pass the scene shifts again. From our perch, still high on the mountain, we are looking down upon a fertile hacienda, on broad open valleys stretching among low hills, which are covered with heavy tropical forests, on meadows with grazing herds and on broad fields of Corn and Cane. In making the descent from the mountain-side to Tamasopo siding the road turns back upon itself in several long loops. At the foot of the mountain it passes through a heavy forest, in whose shade is a Coffee-plantation.

Charlotte, Vt. *C. G. Pringle.*

Foreign Correspondence.

Some New Plants.

Heliconia illustris.—This new introduction from the South Sea Islands is in the possession of Mr. W. Bull, of Chelsea, and is likely to be exhibited in the collections of new plants at the forthcoming quinquennial exhibition at Ghent. It is certainly one of the most beautiful plants of the Musa family, and is certain to become a great favorite with growers of beautiful-leaved stove-plants. It has the habit of H. metallica or H. spectabilis; the leaf-stalks are a foot long and colored bright rose, the blades are a foot long by four inches in width, and they are colored red-purple, with clear rose-pink midrib and veins. Mr. Bull is

to be congratulated on having added such a handsome plant to the many beautiful stove-plants which we owe to his energy as an introducer of new things.

Fritillaria Whittallii is a new species, which is now in flower at Kew, and which has been named in compliment to its discoverer, Mr. E. Whittall, who found it in Smyrna and sent it to Kew last year. It is similar to the common Snake's-head (F. meleagris), differing chiefly in its shorter segments and dull brownish color. F. meleagris is now beautiful in a large round bed on one of the lawns at Kew with its nodding flowers on stalks a foot long, some white, some reddish or brown and spotted, all elegant and pleasing both in form and color. It is a good companion to the Daffodils, Hyacinths, etc.

Cyrtanthus intermedius.—This is a new hybrid of garden origin which has been raised in Mr. Bull's nursery, its parents being C. angustifolius and C. Mackenii, both of them small, narrow-leaved species with slender scapes a foot long bearing a few-flowered umbel of narrow tubular flowers, two inches long, colored bright red in C. angustifolius, white in C. Mackenii. In the hybrid the flowers are rose-colored, slightly suffused with green. If the hybrid inherits the adaptability to cultivation of C. Mackenii it will be a useful plant for the cool greenhouse, but if it is anything like as difficult to keep in health as C. angustifolius it will not find many admirers. C. lutescens is similar in habit to and quite as well behaved under cultivation as C. Mackenii, and its flowers are colored bright yellow. The above is the second hybrid Cyrtanthus raised in gardens, the first being the remarkable C. hybridus raised by Sir Trevor Lawrence a few years ago from C. sanguineus and Vallota purpurea. There are evidences in England of a revived interest in bulbous plants from South Africa. Only this week I have been consulted by two amateurs who had imported collections of them from the Cape, and wished to know how the less well-known kinds should be treated.

Vellozia equisetifolia.—I quote the following note from R. W. Adlum, Transvaal, which appeared in the *Gardeners' Chronicle* of April 1st, as it refers to a most interesting plant which was introduced to Kew a few years ago and has since been distributed under the name of "Witsenia species": "Imagine a stout Dræcena-like stem two feet high, crowned with long, drooping grass-like leaves, interspersed with many solitary pendent pale blue Zephyranthes-like flowers, four inches across. No one at first sight would take this fine plant to be an Amaryllid, since root, stem and leaves are like those of Dracæna. It is a very rare plant in Natal and the Cape, and is only found here in the driest and most rocky places, at great elevations, generally about 6,000 feet. About six years ago I collected seeds of this plant and sent it to Professor McOwan, of the Cape Town Botanical Gardens, who in turn forwarded it to Kew. It is a plant that transplants very badly." Some time ago I drew the attention of readers of Garden and Forest to the interest and beauty of the Vellozias and Barbacenias, which are now scarcely known in gardens. The perpetual-flowering Barbacenia squamata is now bearing numbers of its bright vermilion flowers in one of the stoves at Kew, where it has been represented by a fine specimen for the last three years. This plant has matured plenty of seeds from which numerous seedlings have been raised and distributed.

Aglaonema versicolor is a new stove Aroid lately introduced from the east by Mr. W. Bull. It is described by Dr. Masters as a small plant having an erect stem, bearing beautifully mottled, short-stalked, spreading leaves, the blade four inches long by two inches in width, irregularly blotched with patches of dark velvety green interspersed among patches of lighter green and some of milky white. It has not yet flowered, so that its name is only provisional. Hypolytrum Schrœderianum is another of Mr. Bull's new introductions, and a very promising plant for tropical houses. It is a Sedge, and forms a handsome tuft a yard high, the leaves over two inches wide, purplish at the base, the upper portion green, with dark red margins. This plant will be useful for aquaria.

Tamarix kashgarica.—This is a new plant offered by Monsieur Lemoine & Son, of Nancy, who describe it in their catalogue as having been discovered by Roborowsky in central Asia, and as differing in aspect from the other species of the genus. It has small glaucous green leaves imbricated as in a Lycopodium. It has not yet flowered under cultivation. Messrs. Lemoine do not say to what size it grows, or whether it is hardy with them, but from the brief description they give of the plant it appears to be worth looking after.

Galanthus maximus.—This is another new species of Snowdrop, which Mr. Baker describes as being "remarkable for its very robust habit, large leaves, spathe and flower and long pedicel." Its bulbs are so large that they have been mistaken for those of Narcissus, and its leaves are broad, glaucous, with recurved edges. Its flowers are as large as those of G. nivalis, var. Imperati. Mr. Baker thinks that, if not a true species, it is probably a hybrid between G. plicatus and G. nivalis.

New Dendrobiums.—Dendrobium Wardianum album obtained a first-class certificate last week, and deserved it. The pure white of the sepals and petals and the delicate markings of the lip, which had the yellow blotches, but only a faint indication of the maroon eye-like spots found in the type in a flower of full size, place this among the choicest of the forms of this fine species. It was shown by Mr. W. R. Lee, of Audenshaw. D. Bryan was raised by Mr. Cookson from D. luteolum and D. Wardianum, and it obtained a first-class certificate when shown in flower last week. Mr. Cookson's hybrids are, as a rule, of first-rate merit, and this is no exception. It has slender stems two feet high, primrose-colored flowers with purple-tipped sepals, and a red-brown blotch and lines on the large lip. D. Sybil is another of Mr. Cookson's hybrids, raised from D. bigibbum and D. Linawianum. It has the general habit of D. nobile, to which D. Linawianum is closely allied; the flowers have deep purple sepals, purple and white petals, and the lip white, with blotches of yellow and crimson. It obtained a certificate. D. Benita, a hybrid between D. aureum and D. Falconeri, raised by Mr. Brymer, M.P. Its flowers, which are nearly four inches across, are very similar to those of D. Ainsworthii, which was raised from the same parents.

London. *W. Watson.*

Plant Notes.

Acokanthera spectabilis.

ALTHOUGH it is over twenty years since this plant was introduced into English gardens by Mr. B. S. Williams, of Holloway, and highly recommended to horticulturists by Dr. Masters as a beautiful, fragrant winter-flowering stove-plant, it has yet attained comparatively little popularity. It forms a shapely shrub if grown in a pot and judiciously pruned, or it may be grown against a pillar or as a roof climber; in any position it is a success if only it gets plenty of sunlight all the year round. In the Palm-house at Kew there is a plant of it (see fig. 30, p. 185) trained against the glass, which makes long shoots every year, which in midwinter are wreaths of white Ixora-like flowers, as odoriferous as Gardenia or Jasmine. In the same house there are specimens grown in pots, and these flower most profusely. This species is quite as healthy in a greenhouse as in a stove, the difference being that in the cooler house the leaves become purplish in winter, the shoots are shorter and the flowers do not develop until March.

According to Hooker, A. spectabilis is a native of the western districts of South Africa, from Albany to Port Natal, where it forms a large shrub, with masses of white fragrant flowers, on woody sand-hills near the sea. There is only one other species, namely, A. Thunbergii, which has been in cultivation over a century, and which is almost as serviceable as A. spectabilis, differing in the shape and

size of the leaves and in its smaller flowers. It is the "Gift-boom" or Poison-tree of the Dutch and English colonists, and, like A. spectabilis, has the reputation of being very poisonous. Of course, it is perfectly harmless in the garden. We have sometimes obtained small flowering specimens of these plants by striking branches in the autumn,

Fig. 30.—Acokanthera spectabilis.—See page 184.

and these in January have flowered just as profusely as if they had not been removed from the old plant. For the supply of white, fragrant flowers this plant well deserves the attention of market-growers and others.

[This plant is occasionally found in American gardens under the name of Toxicophlæa.—Ed.]

Cultural Department.

The Cultivation of Bulbs in North Carolina.

I RECEIVE, almost daily, letters from persons in the north inquiring about the commercial cultivation of flowering bulbs in North Carolina. Many of these letters are evidently from men who have had no experience in practical floriculture, but who have been attracted to North Carolina by accounts of the climate, and who are anxious to engage in this business. My uniform answer is that no favoring influence of soil and climate will make up for lack of practical experience, and that without this the attempt to establish a comparatively new industry would fail in nearly all cases. But other in-

quirers are evidently practical florists who are acquainted with the demands of the trade. Some of these can offer only skill and experience, and wish to be employed by growers. Want of capital is the great difficulty in the way of our own people. The growers of Tuberoses in the eastern part of the state have become somewhat discouraged by low prices for bulbs, and they are not inclined or able to buy other bulbs in sufficient quantities to make a profitable business, though a few are experimenting in this way. What is needed is a combination of capital and skill to develop the capacity of the state for this industry. This will probably be done by persons interested in the wholesale bulb trade in the northern cities, as in the case of the Bermuda Lily.

While I am satisfied that the deep peaty soils of the coast region south of Hatteras will grow as good Lily-bulbs as those grown in Bermuda, it is hardly likely that we can compete with Bermuda in the production of bulbs ripe enough for early forcing in autumn. For later use I feel sure that these lands will produce Lily-bulbs of a superior quality.

I have been asked what bulbs could be most profitably grown here. I am not prepared to answer with certainty, and my own experiments at Raleigh will hardly be conclusive as to the capacity of the true bulb soils, as our soil here is of a clayey nature. There will also be found a great difference in the suitability of different localities for the various sorts. In Raleigh we can produce good bulbs of Roman Hyacinths, while Narcissus-bulbs grown here would hardly compare with those grown eastward or in the thermal belt of the sand-hill country. The sandy soils about Southern Pines, Fayetteville and elsewhere in the eastern section will grow Gladiolus to great perfection, and will produce blooming corms from seed a year sooner than Long Island. Our soils here will produce superb Amaryllis-bulbs, but while Lilies do well here we cannot grow such bulbs as the black lands of the east will produce. A gentleman in the section where Tuberoses are cultivated bought Lily-bulbs about the 1st of June last. Having been out of the ground so long the bulbs were hardly first-class, but he stripped the scales and planted them in the open ground. Not much could be expected from such a venture, but, to my surprise, he wrote me last fall that all his scales had grown good bulblets. If this is the case with unseasonable and unskilled treatment, what may we not expect of Lilies in this soil and climate?

The unexampled cold of last January made the blooming of all spring bulbs later than usual, and tested the resistant powers of some of them more than ever before. Roman Hyacinths began, according to their usual custom, to throw up flower-spikes just before Christmas, but the cold and snow put a check upon them. At the beginning of February the snow and frost disappeared, and they soon began growth again, and continued to throw up spike after spike until April. My own Roman Hyacinths, from which the flowers are constantly cut for the sake of the bulbs, will average eight spikes to the bulb. Narcissus of some varieties usually begin to bloom here in late January. This year their flowering was delayed until late in February, and now the varieties are succeeding each other in full beauty. The Chinese Narcissus have survived the winter, but are slower in getting into bloom than the old occupants of our borders. The flowering stems of Ascension Lilies had well started more than a month ago. These bulbs can doubtless be ripened off in this latitude, ready for lifting, a month earlier than in the latitude of Baltimore. They would, therefore, make their autumn leaves and be ready for forcing earlier.

Gladioli are usually well above ground by March 15th, and the bulbs of such sorts as are used for forcing can be ripened here early. Bulblets taken off in autumn and planted at once, with a mulch of fine manure to guard against possible cold, will start very early and make a surprising growth the first season. My present opinion is that the Gladioli, most of the Narcissi (probably all of them), Lilies of all sorts and Roman Hyacinths may be successfully grown here. When the cheapness of land is taken into consideration, I am convinced that, with sufficient capital and skill, the cultivation of bulbs in North Carolina can be made highly profitable.

Raleigh, N. C. *W. F. Massey.*

Plants in Flower.

Russian Violets.—Under this name nurserymen have lately been offering a variety as perfectly hardy and with fragrant flowers. It would be interesting to know the true name of this Violet, for it seems to be a good garden-plant, with stout, firm, dark-colored foliage and with abundant very fragrant double flowers, very dark purple in color. If one can judge from its behavior last winter in an exposed border with heavy soil, it is very hardy. It passed the summer without spot or mildew, and, altogether, is a very desirable plant.

Primula obconica grandiflora.—I refer to this hybrid again to say that some of the plants survived the winter in the border, a fact which seems to indicate an infusion of the blood of P. cortusoides, which was claimed as one of the parents. If by selection we can secure a race of hardy Primulas with the free-flowering character of P. obconica, which is not at all hardy, it will be a great gain. In the open the vile spicules would not be so objectionable as in the closer quarters of the greenhouse. Of course, one winter is a poor test of the hardiness of a plant, for often plants will live through a severe winter like the last and perish incontinently in a milder one, conditions being really less favorable for some reason. Hardiness is a comparative term as applied to plants, but there is nothing comparative about the "occasional helper," who, with spade and pruning-knife, usually spoils more plants than the severest frost. Those of us who cultivate hardy plants, and especially the smaller ones, are forced to give them personal supervision and forbid the helper to trespass on the border, for the bedding mania seems to have left them all with a firm conviction that everything must be replanted each season. The colored brother who favors me occasionally breaks his bonds. As he dug among my fine grasses the other day, and carefully transferred the labels to some seedling Plantains, I thought, among other things, that the race was not advancing very rapidly. I was glad he saved the labels.

Hardy Primulas.—These are charming plants easily had from seed. I find that a stock can be gotten up for spring flowering by sowing seed in August or September, which is usually the time the new crop is received by the seedsmen. These seedlings should be kept in a warm frame or cool house, where they will gradually make progress, and will come into flower in March or April. My crop this year flowered early in March, and are still in flower, but I should have retarded them to plant out before they bloomed. Dean's hybrids are a very satisfactory strain with large well-colored flowers.

Eranthis Cilicica, for which I was indebted to Mr. Whittall last year, is a good companion to E. hyemalis, which it succeeds. It has flowers of rather deeper color, and the leaf is more finely cut and elegant than that of the better-known species.

Anemone Cypriana alba, introduced by Max Leichtlin, is a distinct variety with greenish white flowers, but as a garden-plant not as attractive as A. blanda, a clump of which is yet, when the sun shines, the brightest and most attractive thing in the garden. A. blanda is slow to become established sometimes, but is indispensable in the early garden. Mr. Whittall has collected two new forms, but they have as yet not made much progress here. The Taurian plants collected by Mr. Whittall prove perfectly hardy here and well adapted to the climate. They include Chionodoxas, Scillas, Fritillarias, Anemones, Snowdrops, Irises, Gladioli, Eranthis, Cyclamens, Crocuses, Narcissi, Tulips, Colchicums, Ornithogalums and Alliums, among which, being collected bulbs, there are often to be found specially interesting varieties.

Elizabeth, N. J. *J. N. Gerard.*

Sowing Annuals.

One of your correspondents lately advised the sowing of the annuals on a hot-bed. A hot-bed is certainly very useful when it can have constant care, but dangerous to trust to the changes of our spring weather without close supervision. The common annuals, grown in gardens, scarcely require special forwarding, and for most of them the forcing of a hot-bed is rather a detriment than otherwise. In this latitude I find the most simple and satisfactory way to sow ordinary annuals and perennials, which flower the same season, is in a frame. About the 20th of April, usually, making up a seed-bed in a warm corner, I surround it with a frame made of four boards, nailed at the corners. Over this is placed a screen, made by tacking cheese-cloth or waterproof-shading to a frame made of narrow strips. After two or three bright days the ground will have warmed up sufficiently and the seeds of all the annuals, tender or otherwise, from Asters to Zinnias, may be planted with safety and will germinate promptly. If there should be a very heavy rain-storm it may be necessary to place some sloping boards to shed the water, but otherwise such a frame is perfectly safe. Most of the seeds of the favorite annuals will germinate in a week or ten days, and at this time the screen should be lifted and as much air as possible given. By taking advantage of dull days the seedlings may be soon inured to full exposure. After the screen is off it will be the part of prudence to lay some brush over the seedlings to discourage cats and chickens.

Such a frame is not only simple and inexpensive and expedites the growth of the plants sufficiently, but it is also a great saver of labor. Everything can be seen at a glance and can be attended to rapidly. Where seeds are sown in patches around the garden it requires time and vigilance to watch them all, and many failures are certain. An immense number of seedling-plants can be disposed of in an ordinary garden, and they can be dibbled out rather more rapidly than seedlings sown in the borders can be properly thinned out. In transplanting seedlings the screens, cloth-covered, as mentioned above, will be found very useful and labor-saving. When one has little time to devote to the garden and is not over-fond of work, devices to save time and labor enable him to keep up the garden without being hurried. The seedlings should be carefully lifted, separated and firmly planted, the earth being especially firmed about the roots. They should be well watered and mulched with well-rotted manure, and then a cloth-covered screen should be tilted over the bed and allow it to remain till the first shower begins. In this way the plants are established with the least possible care and attention.

Elizabeth, N. J. *J. N. G.*

Chrysanthemums.—Plants for specimens should now be in six or seven inch pots, and plunged in sand or coal-ashes in cold frames. About the middle of May they should be ready for the final shift into ten or twelve inch pots, in which they will remain and bloom. The soil should be moderately rich loam. If light, it should be packed firmly; if heavy, lightly, but always evenly. It is well to keep the plants for a few days in frames, or until new roots are formed, when they may be plunged outdoors up to the rim of the pots. As they will remain until autumn, it is better to place them three to four feet apart, so as to give room for easy passage among them to do the work of stopping, staking and tying. As the drainage should at all times be free, some means must be adopted to prevent the entrance of earth-worms from below, or they will work the soil in among the drainage, and finally close the vent. Slates or slabs of wood, often used, are objectionable, since they do not freely admit of air, or allow of the passage of water. Something which will carry the base of the pot well clear of the soil is needed, and this we do by placing under them rings of earthenware, made by a local manufacturer. Whatever success I have had I attribute as much to this little device as to any other cause. Stopping, or taking out the tips of the shoots, should be done every few days, care being always taken to keep the plants well balanced.

Wellesley, Mass. *T. D. H.*

Maxillaria Harrisoniæ.—This excellent Orchid blooms very freely during the winter and early spring months. All the parts of the flower are large and fleshy, and the two lower sepals are joined and elongated at the base, forming a sort of spur. The sepals and petals are creamy white, the lip purple and yellowish, with numerous lines of bright red in the interior. There are several varieties of M. Harrisoniæ, differing from the species mostly in the color of the flowers, which in every case have a slight pleasing odor. A large number of generic synonyms exist, of which Lycaste is more common than any other, although it is many years since Reichenbach referred the plant to the genus Bifrenaria. M. Harrisoniæ and its varieties make most satisfactory progress in the cool Orchid-house, the low temperature and moist atmosphere of which seems to suit them. Forty-five degrees, Fahrenheit, is a good average night temperature in winter, and strong sunshine should be guarded against at all times. A good supply of water is always necessary, and the drainage material should, therefore, be ample. The plants may be potted in rough peat-fibre, mixed with a little lumpy charcoal, any time after the flowering season.

Cambridge, Mass. *M. Barker.*

Tomatoes.—It is surprising that so few people are aware that yellow-fleshed tomatoes have a more delicate flavor than any others. Even in the large markets the yellow varieties are rarely seen, and yet, if they had not the merit of superior quality, it would be worth while to grow them for the attractive appearance they make when sliced together with the red-fleshed sorts. The Shah and Golden Queen are good yellow varieties for this purpose. Among the red varieties one must be very fastidious if he is not satisfied with Ignotum, Livingston, Potomac, Brandywine, Mayflower, or Thorburn's Long Keeping. Ponderosa bears a huge fruit, which will, no doubt, win prizes at fairs, but probably it will not be the most profitable kind for market, because its color is not desirable, and then it is not always symmetrical. A purple tinge, such as is found in Ponderosa or Mikado, is a drawback to the popularity of any tomato.

Geneva, N. Y. *C. E. Hunn.*

Correspondence.

Interesting Points near Boston.

To the Editor of GARDEN AND FOREST:

Sir,—Will you kindly name a few places of much natural beauty which can be reached in half-holiday excursions from Boston?

Bridgewater, Mass. *C.*

[There are so many charming scenes in every direction about the New England metropolis that it would be difficult to give a complete list. With only one half-holiday a week, it would take considerably more than one season to cover the ground. One who has the fortune to possess a report of the Metropolitan Park Commission can hardly do better than to follow its guidance in selecting places to be visited, and the contour map accompanying the report gives an excellent idea of the topography of the country. One of the best ways to see the region about Boston is to join the Appalachian Club, which makes pedestrian trips in the neighborhood every Saturday. These trips are very carefully planned, thoughtful arrangements for the comfort and convenience of the members are made, and unusual pains are taken to obtain information concerning the picturesque and historic features of the places visited.

Among the most interesting half-holiday trips is one to the Lynn Woods, going by street-car from the railway-station in Lynn and then walking in any direction through the well-marked foot-paths, or taking a drive in the park carriage that connects with the cars at the entrance to the woods. An excellent map of the Lynn Woods was included in this year's report of the Lynn Park Commission. Several successive half-holidays might easily be spent in roaming through this noble pleasure-ground, without danger of repetition.

The same may be said of the Middlesex Fells, which may be pleasantly reached by steam-cars, either to Medford, West Medford, Winchester, Stoneham, Malden, Fells Station or Melrose, from each of which different portions of this beautiful wild region are accessible. The most interesting section of the Fells lies in the eastern part, and the best way to visit this is by way of Fells Station, on the western division of the Boston and Maine Railroad. The beautiful cascades are only a few minutes' walk from this station, but these run full only during the wet months, and are best seen in the spring-time. A walk across the rough country to the westward takes one to Spot Pond and Bear Hill; the latter is the highest eminence in the region to the westward of Spot Pond, and is best reached from Stoneham.

Another interesting trip is to Woburn, by rail, for a ramble among the wild hills toward Lexington, on the westerly side of Horn Pond. The famous Waverly Oaks, lying between Belmont and Waltham, are but a few minutes' walk from the Waverly Station, on the Fitchburg Railroad. Those who visit the Oaks should not fail to see the Beaver Brook cascade, celebrated by Lowell in one of his most charming poems. It is only a few minutes' walk from the Oaks up the road leading to Lexington, called Mill Street.

Prospect Hill, in Waltham, is the finest outlook point west of Boston, and in height it ranks next to the Blue Hills. A large tract here has recently been taken by the city of Waltham for a public park. Prospect Hill is but a short walk from the Fitchburg station in Waltham. A pleasant stroll across country is to the neighboring eminence of Bear Hill, to the south-westward, and thence southerly along the line of Stony Brook, a large portion of the valley of which belongs to the Cambridge Water Supply reserve, and thence south-westerly to Doublet Hill, in the town of Weston, where glorious views up and down the valley of the Charles are obtained.

There are numerous interesting excursions to be had on

the Charles River, the nearest of which is to the great metropolitan boating-ground between Riverside Station, on the Boston and Albany Railroad, in Newton, and Waltham. Boats may be easily hired either at Riverside or Waltham. One of the wildest and most beautiful examples of natural scenery in the neighborhood of Boston is that of the Hemlock Gorge of the Charles, below Echo Bridge, at Newton Upper Falls, very near the station of the Boston and Albany Railroad on its Newton Circuit branch.

Another pleasant boating-ground on the Charles is at Dedham, reached by the Dedham branch of the Old Colony Railroad. The same branch will take one to Roslindale Station, near which is Bellevue Hill, the highest ground within the corporate limits of Boston. Superb views are to be had here from the outlook in the water-tower, and a stroll southward will take one through the wild Muddy Pond woods to the town of Hyde Park, with fine vistas of the Blue Hills across the Neponset valley. The Great Blue Hill is best reached from Readville Station, on the Old Colony Railroad, and a rough walk eastward through the range brings one out at West Quincy Station, on the Granite branch of the Central division of the Old Colony.

The Neponset valley has some very beautiful scenery. It may be reached from Hyde Park, Mattapan and Milton Lower Mills. At Milton Lower Mills a walk over the highway up Milton Hill gives one a superb view down the estuary of the Neponset into Dorchester Bay, one of the most beautiful sea-coast landscapes in New England. On the South Shore notable attractive points are Merry Mount Park and Faxon Park in Quincy. The former is best reached from Wollaston Station, on the Old Colony's central division, and the latter from Braintree Station. Other strikingly beautiful landscapes on the South Shore are along Weymouth Fore River, best reached from Weymouth Station, on the South Shore branch of the Old Colony, and the neighborhood of Hingham by the same railroad.

No mention has been made of the various interesting harbor excursions by steamboat, or of the visits to historical places like Lexington and Concord, these being so well known.—Ed.]

Polyanthus Narcissus at the Columbian Fair.

To the Editor of Garden and Forest:

Sir,—A nice display of Polyanthus Narcissus, sometimes called clustered Daffodils, was made in the early part of April in one of the greenhouses of the World's Fair grounds. They were from Dutch bulbs, sent by H. Zijp, Haarlem, and were potted about the middle of December. Rather more than a thousand well-formed plants, from ten inches to two feet high, and with umbels five to fifteen flowered, afforded a representative variety of these standard plants, which have ever been favorites for home cultivation. Hyacinths, mostly single-flowered forms, from Mr. J. C. Vaughan, of Chicago, were interspersed with them, and added to the attractiveness of the exhibit.

Grand Monarque ranks among the most satisfactory of the nine varieties shown. The flowers have a broad white perianth and a deep lemon-yellow crown, from eight to twelve of them being borne in a cluster. Muzart orientalis has a shorter scape, with flowers similar in color, a shallower cup, and a smaller, waxy-white perianth. Prince Metternich, with a white perianth and bright yellow crown; Lamartine, white, with golden-yellow crown; Gloria Mundi, a creamy white with a yellow cup, are all good and distinct. The plant labeled Pearl White is much like the form known as Paper White, and was the only pure white in the collection. The plants are fifteen to eighteen inches high, and the umbels five to ten flowered. The best of the yellows, and the most showy plant in the collection, was Grand Soleil d'Or, which carries a golden-yellow flower, with a deep orange crown. Jaune Supreme, a sulphur-yellow, with orange crown, closely resembles Bathurst, with a primrose-yellow perianth and orange cup. The scapes of each average hardly a foot in height, and the umbels are from six to fifteen flowered.

Mr. Vaughan's Hyacinths were mostly show varieties, like Lord Macaulay and the bright carmine-colored Queen of Hyacinths. Of pure whites, Madam Van der Hoop was noticeable for its broad leaves and large flowers in a rather open raceme, and Grand Vanqueur for its large, dense truss. Elfride, a white, tinged with pink, has a very open truss, the exceptionally large flowers showing well individually. Moreno, a peculiar salmon-pink tint, was quite distinct. L'Or d'Australie is a rich cream-yellow, and La Citronière is much like it, but paler. Blondine has a good-sized truss of blue flowers, and William I. has flowers of so dark a purple as to be almost blue-black.

Englewood, Chicago, Ill. *E. J. Hill.*

Wayside Planting by Village Improvement Societies.

To the Editor of Garden and Forest:

Sir,—In the planting of trees by village improvement societies both use and beauty should be included in "improvement." What is useful and beautiful in one case may be unnecessary and unpleasing in another. The great aim should be appropriateness. For instance, no tree is more suitable for shading village streets than the Elm, its high arching branches affording ample shade for comfort and not enough to keep the road in a muddy condition after rain. The old New England towns owe much of their charm to the wayside Elm. I refer especially to villages and towns where houses and shops are close together. Outside of towns, on inland high-roads, long level stretches of Elms may be used effectively, especially where clusters of houses at short intervals form a semi-detached village. There are many other fine shade-trees which may be planted for variety—the Oak, Maple, Beech, Chestnut and Linden. The Tulip-tree has recently been suggested for road-side planting, but it is not a graceful tree for this purpose.

For a shade-tree along much-frequented inland roads the Elm has an evident advantage over conically shaped trees. It is admirably adapted, also, for planting on home and school-house grounds and for shade in fields. Along less-frequented roads, in many places, no trees should be planted at all. I have in mind a country road where occasional White Birches had grown up irregularly, and Maples had recently been planted on either side. In several instances a young Maple was set out directly under a good-sized Birch. The new trees might have been grouped naturally at intervals for shade and thus made to harmonize with the irregular Birches, but the effect of this planting was formal in the extreme. I know also a triangle by a country highway where a few Pitch Pines at one end have been left in a group. I doubt if any one would have thought of planting Pines in such a spot in such a manner, but the effect of this natural arrangement is both interesting and beautiful.

As a rule, our country road-sides are at their best when planted by nature. Open views on one or both sides of the way, alternating with shady spaces, are vastly more attractive than continuous, monotonous, artificial planting. Occasionally we see a piece of road on which trees would be an improvement, especially where a new way has been cut through a bare region. But often nothing is wanted beyond leaving the bushes and vines unharmed. Now and then there is an obtrusively ugly spot where an adjoining bank of the highway has been dug out for gravel or blasted for rock. In such a spot a clump of English Beeches or White Birches in the foreground would quickly soften the effect. In repairing our roads, care should be taken not to disturb the wild Roses, Barberries, Elderberries and many other delightful shrubs and flowers, where they will flourish and multiply if left alone; if these have been disturbed it would be well to replace them.

I would urge, also, that our country roads be not widened unnecessarily. In villages and towns wide roads are important, but in the country, narrow roads are, as a rule, much more picturesque. As to the useful side of the question, Professor Shaler, in a recent article on the "Betterment of our Highways," writes: "In this country, as well as in most of the states of Europe, the tendency is to make the road-bed a good deal wider than sound practice dictates. A part of the badness of our American roads is generally due to the fact that the tracking is far too wide to be effectively maintained. In this, as in many other of the grosser arts, we may well take a lesson from the ancient Romans, perhaps the earliest skillful road-makers in the world. Their roads were, indeed, much narrower than those which are commonly found in our country districts."

If more trees are desired for a tree-lined sea-shore road with occasional stretches affording glimpses of the ocean, other kinds than inland Pines should be chosen. These should not be set regularly in a row, but in occasional groups. Willows, and in some especially adapted places a row of Lombardy Poplars, harmonize with marsh or sea. An objection to Lombardy Poplars may be made because they are not long-lived; but where they are planted at rare intervals for beauty, not for shade, they can be replaced after a number of years.

I should suggest that these three points be borne in mind: Where continuous passing and frequent houses close to the road (as in village streets) demand shade-trees, there artificial and regular tree-planting, especially of Elms, is appropriate both for use and beauty. That in improving country roads outside of villages, we should remember that improving does not necessarily mean changing in effect, apart from keeping the road in order. That what may be a most charming addition inland may be inharmonious by the sea; and that in every case we should consider whether we are working for use or for beauty, or for both combined, so that each result may be appropriate.

Pride's Crossing, Mass. *L. P. L.*

Pruning Grape-vines.

To the Editor of GARDEN AND FOREST:

Sir,—By an oversight several Grape-vines on my place were not pruned last autumn or during the winter. I am told that if they are pruned now they will be weakened by much bleeding. What is your advice in the matter?

Hartford, Conn. *R. A.*

[Prune the vines at once. They will undoubtedly bleed freely, but we have never seen any evil effects from such a loss of sap. With very vigorous vines this loss might tend to lessen the growth of new cane, but sometimes this would be a desirable result. One who is nervous at the sight of blood and apprehensive of injury will be spared some alarm by simply rubbing off the buds which are not wanted, and then waiting to prune until the remaining buds have expanded into leaves and have made a good growth. The early run of sap will drop almost as soon as the cut is made, but no such loss occurs to growing vines when they are summer-pruned and the leaves are doing their work. Some German gardeners defer their pruning until the buds are well started, late in May, and they are successful cultivators of the Grape. Opinions differ among experts as to the best time for pruning. Many insist that February is the only proper season for this work, but the preferable practice seems to be to prune in October and November after the leaves fall. However, when this is neglected for any reason, as in the case of our correspondent, we should have no hesitation about pruning at the present season.—ED.]

Recent Publications.

Economic Fungi. By A. B. Seymour and F. S. Earle.

The fifth fascicle of this series of specimens, designed principally to illustrate the fungous diseases of useful and noxious plants, is chiefly concerned with "Uredineæ parasite on woody plants, including gymnosporangia, with their æcedial stages." Professors Seymour and Earle, in editing and publishing this work, are doing a valuable service to all who are interested in the subject of mycology, and to vegetable pathologists in particular. While thirteen families of plants are represented among the fungi considered in fascicle v. (Nos. 201 to 250), the two orders which take the lead are the Rosaceæ and Coniferæ, the former containing the Æcidial and the latter the Teleutosporic forms of the several species of gymnosporangium.

From the standpoint of the fruit-grower, perhaps, the most interesting specimens are those of Gymnosporangium globosum, Farl., and G. macropus, Lk. The former is common upon the Red Cedar, as small galls, while the latter produces the so-called "Cedar-apples," which often measure an inch in diameter and have long orange gelatinous horns during moist weather in spring. From the Cedar the spores are carried to the young apple-leaves and there produce orange patches, which, in the worst cases, are confluent and cover the whole leaf. This collection shows fine specimens of the two species, both upon the Cedar and the Apple. The G. globosum grows upon several species of the Rose family, and specimens are shown upon Cratægus coccinea, C. punctata, Pyrus Americana and P. coronaria.

Of interest to the mycologist are the specimens of Gymnosporangium Bermudianum, Earle. This fungus is remarkable in that the two forms are produced in succession upon the same galls upon the Juniper. In other words, the Æcidial form precedes the final spores upon the Cedar, and no member of the Rosaceæ seems necessary in the life history of this rust. The new species of Pine-rust, Coleosporium Pini, by Professor Galloway, on leaves of Pinus inops, is also included, while several species of Peridermium of the Pine group are given.

How to Know the Wild Flowers. By Mrs. William Starr Dana. Illustrated by Marion Satterlee. New York: Charles Scribner & Sons.

The purpose of this book is well set forth in its sub-title, where it is described as a guide to the names, haunts and habits of our common wild flowers. This is practically the purpose which an ordinary manual of botany serves, but the author, as is explained in the preface, imagines that learners have a dread of technical terms and scientific classification. The plants described are, therefore, not arranged in natural orders, but are grouped by colors in accordance with a suggestion once made by Mr. John Burroughs. On this plan about a hundred pages are devoted to white flowers and their description, fifty more to yellow flowers, and so on through pink, red, blue, purple and miscellaneous to the end. The flowers of each color are then arranged as far as possible to conform with their time of blooming, so that the learner will find flowers succeeding each other in the same order as that in which they appear by brook-side and road-side. The book does not attempt to furnish a complete list of plants. Buttercups, Wild Roses, Thistles and other species which everybody is supposed to know are ruled out. Plants with inconspicuous flowers, among which are mentioned Ragweed and Plantain, are also excluded, as well as the rarer plants and escapes from gardens. Each plant has a brief description with the common and scientific name and the English name of the family to which it belongs. There are illustrations of rather more than a hundred of the flowers described, and in choosing the subjects those which are prominent for their beauty or for their special interest have been usually selected. The pictures are gracefully drawn, but since they have been prepared for the special purpose of identification, it would have been better if less study had been given to mere artistic effect and more pains taken to show sharply the distinctive characters of the subjects. Careful reproductions of outline drawings would have been more useful than the text as a popular aid to determining species, but one might be thoroughly familiar with some of the plants figured here and yet be unable to identify their portraits; still the pictures are generally helpful as well as pretty. Their usefulness would have been increased if the scale on which they are drawn had been indicated in every case.

All efforts to familiarize people with our native plants and flowers are praiseworthy, and we trust that this book will stimulate many readers to investigate our native flora. There may be persons who like its poetical quotations and the chatty talk of its descriptions better than the more exact and complete statements in botanical handbooks, although we apprehend that it is a mistake to suppose that detailed botanical descriptions are dry to any one who has a real desire to study flowers.

Potash in Agriculture is a little pamphlet which has real value, although it is issued from the office of the German Kali Works in this city as an advertisement of the potash salts which they have to sell. The quotations from the experiment-station bulletins, in which are recorded the results of using potash as a fertilizer, make an interesting body of experience. Years ago the use of plaster was universal in many farming regions where it now shows no good results. We have sometimes thought that this was because the plaster had helped the plants to exhaust the potash-supply in the soil. At all events, we have observed that the use of potash on such lands has generally proved immediately efficacious.

Notes.

A man, now living in Bushkill, Pennsylvania, who is sixty-seven years of age, planted a White Pine-tree near a spring on his father's farm when he was a boy some twelve years old. The circumference of that tree is now ten feet and seven inches.

We have often invited attention to the beauty of the leaves of forest-trees in spring, and have ventured to assert that for variety and delicacy of color they are not excelled even by the display of rich color which makes our woods famous in autumn. In this latitude there are few trees showing leaf as yet, but last week the light yellow-green leaves of the Willows just began to appear, and in bright sunshine the trees were singu-

larly beautiful, as they seemed to be enveloped in a luminous mist.

A correspondent writes that he has lately sent to a dozen of the leading plantsmen of the country for the single white-flowered Pæony, Pæonia albiflora, and has been unable to get a plant. This is not a new plant, and it ought not to be difficult to obtain. The flowers are of the purest white and of a satiny texture, four or five inches in diameter, rather cup-shaped, and enclosing a cluster of bright yellow stamens. Besides being one of the most beautiful of hardy flowers, here, these Pæonies are delightfully fragrant.

A late number of the London *Garden* contained a beautiful plate representing several choice varieties of Dendrobium Phalænopsis, and the beauty of these flowers will make it apparent why the lovers of Orchids should be grateful that this species has now been collected in such quantity as to place it within the reach of every one. The plants grow freely and mature their pseudo-bulbs if kept in a hot moist house during the summer, where, in the climate of England, they are exposed to full sunshine. Hybridists are already making successful crosses between this and other species.

A German horticultural paper calls the attention of tourists to the fact that they may be grievously deceived in thinking that the objects which they buy in Switzerland, decorated with dried blossoms of the Edelweiss, are really mementoes of the Alps. An enterprising horticulturist near Dantiz, on the northern coast of Germany, has, we are told, established an Edelweiss-farm, whence, last year, considerable quantities of the flowers were sent to a tradesman on the other side of the Alps, while this year the amount thus exported will be twice as large. The seeds are sown in tepid fertilized beds at the end of March or beginning of April, and are transplanted once before they are set out in the fields in July, after which it is only needful to weed the ground and loosen the soil around the plants.

The third edition of *Les Maladies de la Vigne*, by Professor Pierre Viala, recently appeared at Paris and Montpellier in the series entitled *Bibliothèque du Progrès Agricole et Viticole*. The second edition, which appeared in 1887, was a volume of 462 pages, well illustrated with wood-cuts and a few colored plates. The present edition, which was awarded the Desmaziéres prize by the French Institute, is a superb volume of nearly 600 large octavo pages, beautifully printed and admirably illustrated. The subject-matter has been entirely remodeled and brought up to date, including the results of researches, some of which were made as late as 1892. There is probably no work relating to the diseases of any cultivated plant which has ever been offered to the public in so attractive a form, and none which furnishes a more complete and scientific account, both of the diseases and the methods of combating them. The author is to be congratulated on the successful publication of a work destined to form one of the classics of vegetable pathology.

We have received from Mr. T. S. Brandegee, of San Francisco, a specimen of the wood of Populus Monticola, the fine Poplar-tree which he discovered in Lower California, and which was figured in these columns (vol. iv., p. 329). This specimen, which only shows the sap-wood, is quite unlike the wood of other Poplars; it is light red, much resembling cherry in color, and is close-grained, moderately hard, and shows a handsome satiny surface. It appears well suited for the interior finish of houses or for the better classes of cabinet-work; and it is therefore desirable that this tree should be tested for timber in countries with temperate climates. As it grows naturally at a considerable elevation above the sea, where the temperature sometimes falls below freezing-point, Populus Monticola might be expected to thrive in southern California and in all the Mediterranean basin. As it is a tree of large size, and as it will probably grow under favorable conditions as rapidly as other Poplar-trees, its introduction as a source of timber-supply may prove to be a matter of great economic importance.

Many French horticultural societies have petitioned the Government during recent years to substitute fruit for forest trees in the plantations made along railway routes. To these petitions the Ministry of Public Works has now replied by saying that, some twelve years ago, it recommended the employment of fruit-trees for the purpose named, that extensive experiments had since been made, and that these experiments had shown the inferiority of fruit-trees to forest-trees. Either the fruit-trees had not flourished or they had been pillaged and mutilated by marauders; and, moreover, they cast too heavy a shade, thus causing dampness and deterioration in road-beds near which they stood. "It is needful," says the explanatory circular, "that trees planted along tracks shall be capable of developing in isolation into tall slender forms, so that excessive shade may be avoided; and this requirement is best fulfilled by forest-trees. Therefore the administration has renounced the attempt to popularize the plantation of fruit-trees except in one or two departments, where a single species of nut-bearing trees will henceforth be admissible." In Belgium the case is about the same, and, indeed, a member of Parliament remarked, when the question was recently under discussion, that the only trees which should be planted along railway-tracks were telegraph-poles.

Professor J. P. Stelle, agricultural editor of the Mobile *Register*, feeling assured that the pecan-nuts grown in the city of Mobile were of remarkably good quality, invited persons with trees in bearing to send him some samples. He received nearly a hundred responses, and early in the year he published a classified description of twenty-two of these nuts, grading them according to (1) size of nut, (2) thinness of shell, (3) fullness of interior, (4) firmness of kernel, and (5) excellence of flavor. Being judged in this way, some of the largest and most beautiful nuts were classified below the smaller ones which had reached a higher development in other particulars than size and appearance. The nut which headed the list was slightly conical in shape, about one and three-quarter inches in length and one inch in diameter. The second nut was two and one-eighth inches long and seven-eighths of an inch in diameter, blunt at each end, regular and with a firm kernel of exceedingly fine flavor. The tree which bore this is now fifty feet high, and came from a nut planted thirty years ago, and bears from six to seven bushels of nuts annually. The third was one and three-quarter inches in length and one inch in diameter, slightly conical and sloping toward the beak from one-quarter of the length of the base. From the twenty-two descriptions given, it is plain that the nuts were sufficiently distinct to warrant their division into separate classes. They differed widely in many particulars, but the shells of all were so thin that any of them could have been crushed in the hand by pressing two of them together. Judging from the recorded yields of the trees which bear many of these nuts, it is not surprising that one of Professor Stelle's correspondents should state that a bearing Pecan-grove was worth more to its owner than an Orange-orchard, or, indeed, than any other kind of an orchard.

At a sub-station of the Michigan Experiment Station trials have been carried on for some years with a view to discovering plants adapted to the sandy soil of the Jack Pine Barrens in the northern part of that state. There is very little vegetable-mold in this soil. The winters are long and cold, there is always danger of untimely frosts in late spring and early autumn, and, although the entire rainfall of the year is not short of the average for the region, a long summer drought is usual, when the sun beats on the sand and scorches all vegetation which has not extraordinary powers of endurance. The European plant known as Spurry (Spergula arvensis), a member of the Pink family, has been tried now for some years, and both the officers of the station and the farmers who have tested it have found it a good plant for plowing under to fertilize the land as well as an excellent forage crop for cattle and sheep. The seed germinates very quickly, and a field will be green on the third day from sowing. In six weeks it can be mowed for hay and the seed will be ripe in eight weeks. It is in the best condition for pasturage from four to six weeks after sowing, though, if necessary, animals can be turned into the field much sooner. One farmer writes, that with proper care fifteen or twenty bushels of the seed, which is smaller than clover-seed, can be raised to the acre. But since Spurry dies after seeding, the experimenters are looking for a perennial plant which has value, both for forage and for green manure, and which will endure pretty severe frost, and roots so deeply as not to be injured by severe drought. Experiments are now in progress in the Michigan Barrens with the so-called Flat Pea, Lathyrus silvestris, a plant long known to botanists in Europe, and which, in its wild state, contains elements unpalatable and unhealthful to animals. It is claimed that Herr Wagner, of Wurtemburg, has bred out these undesirable qualities, and seed of this strain is under trial. The experimenters do not care to make positive assertions about the value of this plant as yet, but so far it promises to endure considerable frost, to winter well and to make good growth on this soil. It does not seed until the second year, but cattle eat the green forage readily.